NOTE: The document identifier and heading have been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

INCH-POUND

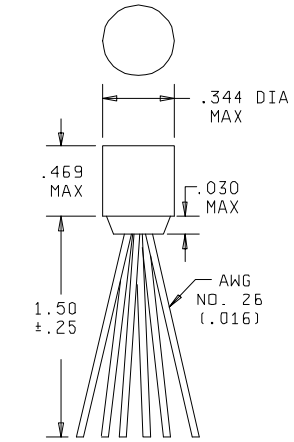
MIL-PRF-27/172D
24 May 1989
SUPERSEDING
MIL-T-27/172C
25 April 1988

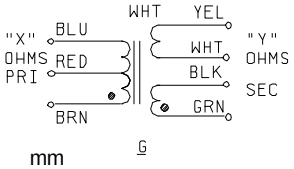
PERFORMANCE SPECIFICATION SHEET

TRANSFORMERS, AUDIO FREQUENCY, SUB-MINIATURE, TF5R21ZZ

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-T-27.





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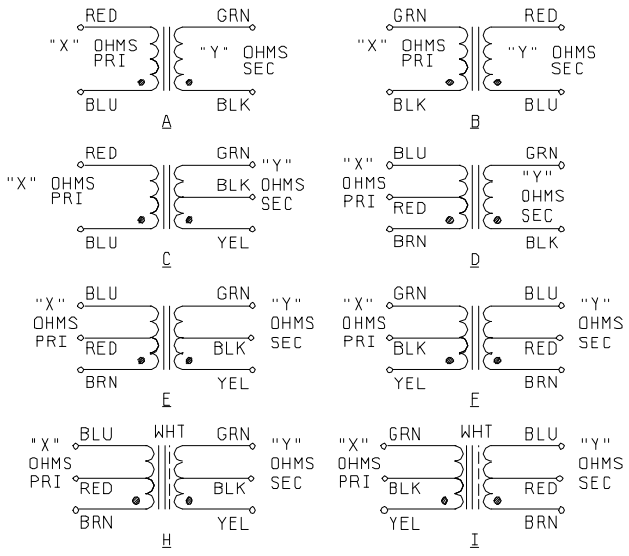

Inches	mm
.016	0.41
.030	0.76
.25	6.4
.344	8.74
.469	11.91
1.50	38.1

WORKING VOLTAGE(PEAK): 50V
ALTITUDE: 150,000 FT MAX
(SEE TABLE I FOR VALUE OF "X" AND "Y")

CIRCUIT DIAGRAM

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Marking shall be on the side of the case.
4. Primary and secondary electrical values shall be marked as specified in table I, as applicable.

FIGURE 1. Dimensions and configurations.

(D) denotes changes

REQUIREMENTS: (When colors in parentheses, i.e. (Brn-Blu), are used, they indicate the winding and the extreme terminals of the winding. When the extreme terminals of two windings are used, i.e. (Grn-Yel), the windings are connected in series.)

Electrical ratings: See table I.

Working voltage (peak): 50 V.

Frequency range: 300 Hz to 100 kHz.

Design and construction:

Dimensions and configuration: See figure 1.

Duty cycle: Continuous.

Terminals: Solid wire, insulated. Insulation shall not be polyvinyl chloride.

Composition: D in accordance with MIL-STD-1276.

Diameter: 0.016 inch.

Length: 1.50 inches ±0.25.

Final finish: Tinned.

Ⓓ Weight: 4.50 grams, maximum.

Altitude: 150,000 feet, maximum.

Operating temperature range: -55°C to +105°C.

Terminal strength: MIL-STD-202, method 211, test condition A, 2.0 pounds.

Vibration (high frequency): MIL-STD-202, method 204, test condition B.

Dielectric withstanding voltage:

At sea level: 100 V rms.

At barometric pressure: 100 V rms.

Electrical characteristics: See table II.

No load (center tap unbalance): ±1 percent at 1 V, 5 kHz across the primary.

Harmonic distortion: Total harmonic content of the output shall be a maximum of 5 percent at the specified power level and primary dc current (see table I) at 1 kHz to 100 kHz.

Insertion loss: At the specified power level (see table I), the insertion loss shall be a maximum of 3.0 dB at 1 kHz.

Frequency response: ±3 dB at the rated source and load impedances (see table II) with 1.0 mW level output and a reference frequency of 1 kHz.

Self-resonant frequency: Measured with secondaries carrying specified loads, with the secondary voltage observed (see table II).

Marking location: See figure 1.

TABLE I. Electrical ratings. 1/ 2/

Dash no.	Circuit diagram	Primary impedance (ohms)		Secondary 3/ impedance (ohms)		Primary dc current (mA) 4/	Power level at 1 kHz (max) (mW)	Primary dc resistance ±25% (ohms)	Secondary dc resistance ±25% (ohms)
01	G	80 CT 100 CT	(Brn-Blu)	32 SPLIT 40 SPLIT	(Yel-Grn)	12 10	600	9.8	6
02	D	120 CT 150 CT	"	3.2 4.0	(Blk-Grn)	10 10	500	10	0.46
03	"	150 CT 200 CT	"	12 16	"	10 10	500	11	1.5
04	"	300 CT 400 CT	"	12 16	"	7 7	500	20	1.63
05	"	300 CT	"	600	"	7	600	19	89
06	"	320 CT 400 CT	"	3.2 4.0	"	7 7	500	20	0.46
07	G	400 CT 500 CT	"	40 SPLIT 50 SPLIT	(Yel-Grn)	8 6	500	46	8
08	G	400 CT 500 CT	"	120 SPLIT 150 SPLIT	"	8 6	600	"	26
09	G	400 CT 500 CT	"	400 SPLIT 500 SPLIT	"	8 6	600	"	74
10	E	400 CT 500 CT	"	4,000 CT 5,000 CT	"	8 6	600	"	550
11	A	500 600	(Blu-Red)	50 60	(Blk-Grn)	3 3	600	60	8
12	D	500 CT	(Brn-Blu)	600	"	5.5	600	31	90
13	A	600	(Blu-Red)	3.2	"	3	100	60	0.58
14	D	600 CT 800 CT	(Brn-Blu)	12 16	"	5 5	500	43	1.5
15	"	640 CT 800 CT	"	3.2 4.0	"	5 5	"	43	0.46
16	"	800 CT 1,000 CT	"	3.2 4.0	"	4 4	"	51	0.46
17	"	800 CT 1,070 CT	"	12 16	"	4 4	"	51	1.5
18	"	900 CT	"	600	"	4	600	53	89
19	A	1,000 1,200	(Blu-Red)	50 60	(Blk-Grn)	3 3	600	115	8

See footnotes at end of table I.

TABLE I. Electrical ratings 1/ 2/ - Continued.

Dash no.	Circuit diagram	Primary impedance (ohms)		Secondary 3/ impedance (ohms)		Primary dc current (mA) 4/	Power level at 1 kHz (max) (mW)	Primary dc resistance ±25% (ohms)	Secondary dc resistance ±25% (ohms)
20	G	1,000 CT	(Brn-Blu)	16,000 SPLIT	(Yel-Grn)	3.5	100	120	940
		1,200 CT		20,000 SPLIT		3.5			
21	D	1,000 CT	(Brn-Blu)	12	(Blk-Grn)	3.5	500	71	1.5
		1,330 CT		16		3.5			
22	D	1,060 CT	(Brn-Blu)	3.2	"	3.5	500	71	0.46
		1,330 CT		4.0		3.5			
23	A	1,200	(Blu-Red)	3.2	"	2	600	105	0.58
24	D	1,500 CT	(Brn-Blu)	12	"	3	500	108	1.5
		2,000 CT		16		3			
25	D	1,500 CT	"	600	"	3	600	86	89
26	D	1,600 CT	"	3.2	"	3	500	109	0.46
		2,000 CT		4.0		3			
27	G	2,000 CT	"	2,000 SPLIT	(Yel-Grn)	3	600	195	125
		2,500 CT		2,500 SPLIT		3			
28	G	2,000 CT	"	800 SPLIT	(Yel-Grn)	3	125	195	455
		2,500 CT		10,000 SPLIT		3			
29	D	7,500 CT	"	12	(Blk-Grn)	1	100	505	1.6
		10,000 CT		16		1			
30	D	8,000 CT	(Brn-Blu)	3.2	(Blk-Grn)	1	100	505	0.46
		10,000 CT		4.0		1			
31	A	10,000	(Blu-Red)	3.2	(Blk-Grn)	1	100	790	0.68
32	C	10,000	(Blu-Red)	500 CT	(Yel-Grn)	1	125	780	50
		12,000		600 CT		1			
33	C	10,000	(Blu-Red)	1,200 CT	"	"	"	780	115
		12,500		1,500 CT	"	"	"		
34	E	10,000 CT	(Brn-Blu)	1,500 CT	"	"	"	780	126
		12,000 CT		1,800 CT	"	"	"		

See footnotes at end of table I.

TABLE I. Electrical ratings 1/ 2/ - Continued.

Dash no.	Circuit diagram	Primary impedance (ohms)		Secondary 3/ impedance (ohms)		Primary dc current (mA) 4/	Power level at 1 kHz (max) (mW)	Primary dc resistance ±25% (ohms)	Secondary dc resistance ±25% (ohms)
35	G	10,000 CT 12,000 CT	(Brn-Blu)	2,000 SPLIT 2,400 SPLIT	(Yel-Grn)	1 "	125	560	230
36	C	10,000 12,500	(Blu-Red)	2,000 CT 2,500 CT	"	"	"	780	190
37	E	10,000 CT 12,000 CT	(Brn-Blu)	10,000 CT 12,000 CT	"	" "	" "	975	1,175
38	A	20,000 30,000	(Blu-Red)	800 1,200	(Blk-Grn)	0.5 0.5	60	830	115
39	E	20,000 CT 30,000 CT	(Brn-Blu)	800 CT 1,200 CT	(Yel-Grn)	0.5 0.5	60	830	115
40	G	20,000 CT 30,000 CT	"	1,000 SPLIT 1,500 SPLIT	"	0.5 0.5	50	800	113
41	G	40,000 CT 50,000 CT	"	400 SPLIT 500 SPLIT	"	0.25 0.25	50	1,700	60
42	E	40,000 CT 50,000 CT	"	4,000 CT 5,000 CT	"	0.25 0.25	50	1,700	450
43	B	200,000	(Blk-Grn)	1,000	(Blu-Red)	0	25	9,000	100
44	F	200,000 CT	(Yel-Grn)	1,000 CT	(Brn-Blu)	0	25	9,000	100
45	E	600 CT	(Brn-Blu)	600 CT	(Yel-Grn)	4	600	47	47
46 5/	H	4 k CT 5 k CT	(Brn-Blu)	8 k CT 10 k CT	(Yel-Grn)	2 2	100	320	590
47 5/	H	8 k CT 10 k CT	(Brn-Blu)	1,200 CT 1,500 CT	(Yel-Grn)	1 1	100	640	110

See footnotes at end of table.

TABLE I. Electrical ratings 1/ 2/ - Continued.

Dash no.	Circuit diagram	Primary impedance (ohms)		Secondary 3/ impedance (ohms)		Primary dc current (mA) 4/	Power level at 1 kHz (max) (mW)	Primary dc resistance ±25% (ohms)	Secondary dc resistance ±25% (ohms)
48 5/	H	9 k CT 10 k CT	(Brn-Blu)	9 k CT 10 k CT	(Yel-Grn)	1 1	100	850	1,080
49 5/	I	100 k CT	(Yel-Grn)	500 CT	(Brn-Blu)	0	25	7,900	85
50 5/	I	200 k CT	(Yel-Grn)	1 k CT	(Brn-Blu)	0	25	10,700	100

1/ Qualification testing and approval to M27/172-49 or M27/172-44 shall be sufficient to grant qualification approval to M27/172-01 through M27/172-50.
2/ Impedance values written one above the other indicate a range of matching impedances over which the parts will give satisfactory performance as long as the impedance ratio is maintained.
3/ Where windings are listed as SPLIT, one-fourth of the listed impedance is available by paralleling the winding.
4/ Primary dc current shall be the maximum single-ended current for which the transformer will meet the specified performance requirements. For push-pull, mA dc can be any balanced value taken by .5 W transistors.
5/ Includes electrostatic shield. Shield terminal shall be white. Voltage ratio shall be 2 to 1 at 20 kHz.

TABLE II. Electrical characteristics.

Dash no.	Frequency response: ±3 dB at 300 Hz to 100 kHz and 1 mW 1/		Resonance, self resonant frequency (min) (kHz)	Polarity: Additive with terminals (below) connected
	Z_S (ohms)	Z_L (ohms)		
01	80 CT (Brn-Blu)	32 (Yel-Grn)	1,500	Blu and Yel, and Wht and Blk
02	120 CT (Brn-Blu)	3.2 (Blk-Grn)	1,000	Blu and Blk
03	150 CT (Brn-Blu)	12 (Blk-Grn)	750	Blu and Blk
04	300 CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
05	300 CT (Brn-Blu)	600 (Blk-Grn)	"	Blu and Blk
06	320 CT (Brn-Blu)	3.2 (Blk-Grn)	"	Blu and Blk
07	400 CT (Brn-Blu)	40 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
08	400 CT (Brn-Blu)	120 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
09	400 CT (Brn-Blu)	400 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
10	400 CT (Brn-Blu)	4 k CT (Yel-Grn)	"	Blu and Yel
11	500 (Blu-Red)	50 (Blk-Grn)	"	Red and Blk
12	500 CT (Brn-Blu)	600 (Blk-Grn)	"	Blu and Blk
13	600 (Blu-Red)	3.2 (Blk-Grn)	"	Red and Blk
14	600 CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
15	640 CT (Brn-Blu)	3.2 (Blk-Grn)	"	Blu and Blk
16	800 CT (Brn-Blu)	3.2 (Blk-Grn)	"	Blu and Blk
17	800 CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
18	900 CT (Brn-Blu)	600 (Blk-Grn)	"	Blu and Blk
19	1,000 (Blu-Red)	50 (Blk-Grn)	"	Red and Blk
20	1,000 CT (Brn-Blu)	16 k (Yel-Grn)	"	Blu and Yel, and Wht and Blk
21	1,000 CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
22	1,060 CT (Brn-Blu)	3.2 (Blk-Grn)	"	Blu and Blk
23	1,200 (Blu-Red)	3.2 (Blk-Grn)	"	Red and Blk
24	1,500 CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
25	1,500 CT (Brn-Blu)	600 (Blk-Grn)	"	Blu and Blk

See footnote at end of table II.

TABLE II. Electrical characteristics - Continued.

Dash no.	Frequency response: ±3 dB at 300 Hz to 100 kHz and 1 mW 1/ Z_S (ohms)	Z_L (ohms)	Resonance, self resonant frequency (min) (kHz)	Polarity: Additive with terminals (below) connected
26	1,600 CT (Brn-Blu)	3.2 (Blk-Grn)	750	Blu and Blk
27	2,000 CT (Brn-Blu)	2,000 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
28	2,000 CT (Brn-Blu)	8,000 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
29	7.5 k CT (Brn-Blu)	12 (Blk-Grn)	"	Blu and Blk
30	8 k CT (Brn-Blu)	3.2 (Blk-Grn)	"	Blu and Blk
31	10 k (Blu-Red)	3.2 (Blk-Grn)	"	Red and Blk
32	10 k (Blu-Red)	500 CT (Yel-Grn)	"	Red and Yel
33	10 k (Blu-Red)	1,200 CT (Yel Grn)	"	Red and Yel
34	10 k CT (Brn-Blu)	1,500 CT (Yel-Grn)	"	Blu and Yel
35	10 k CT (Brn-Blu)	2,000 (Yel-Grn)	"	Blu and Yel, and Wht and Blk
36	10 k (Blu-Red)	2,000 CT (Yel-Grn)	"	Red and Yel
37	10 k CT (Brn-Blu)	10 k CT (Yel-Grn)	500	Blu and Yel
38	20 k (Blu-Red)	800 (Blk-Grn)	750	Red and Blk
39	20 k CT (Brn-Blu)	800 CT (Yel-Grn)	750	Blu and Yel
40	20 k CT (Brn-Blu)	1,000 (Yel-Grn)	750	Blu and Yel, and Wht and Blk
41	40 k CT (Brn-Blu)	400 (Yel-Grn)	500	Blu and Yel, and Wht and Blk
42	40 k CT (Brn-Blu)	4,000 (Yel-Grn)	500	Blu and Yel
43	200 k (Blk-Grn)	1,000 (Blu-Red)	100	Grn and Blu
44	200 k CT (Yel-Grn)	1 k CT (Brn-Blu)	100	Blu and Yel
45	600 CT (Brn-Blu)	600 CT (Yel-Grn)	100	Blu and Yel
46	4 k CT (Brn-Blu)	8 k CT (Yel-Grn)	500	Blu and Yel
47	8 k CT (Brn-Blu)	1200 CT (Yel-Grn)	500	Blu and Yel
48	9 k CT (Brn-Blu)	9 k CT (Yel-Grn)	500	Blu and Yel
49	100 k CT (Yel-Grn)	500 CT (Brn-Blu)	100	Blu and Yel
50	200 k CT (Yel-Grn)	1 k CT (Brn-Blu)	100	Grn and Brn

1/ Frequency response shall be within ±3 dB at 300 Hz to 20 kHz and ±4 dB at 300 Hz to 100 kHz at 1 mW for dash numbers 43, 44, 49, and 50.

Part or Identifying Number (PIN): M27/172- (dash number from table I).

SUPERSESSION DATA:

MIL-T-27/172 supersedes the following MS sheets which have been canceled:

MS21375	MS21407	MS21411
MS21377	MS21408	MS21412
MS21393	MS21409	MS21413
MS21406	MS21410	MS21421
		MS53228

MIL-T-27/172 supersedes MIL-T-27/28 and MIL-T-27/144. Supersession data are as follows:

MIL-T-27/172 PIN	Superseded PIN
M27/172-46	M27/28-01
-47	-02
-48	-03
-49	-04
-50	-05
-01	M27/144-01
-05	-02
-07	-03
-09	-04
-10	-05
-11	-06
-12	-07
-45	-08
-18	-09
-19	-10
-23	-11
-25	-12
-27	-13
-28	-14
-32	-15
-33	-16
-34	-17
-35	-18
-35	-19
-37	-20
-38	-21
-39	-22

CONCLUDING MATERIAL

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities:
Army - AR
Navy - OS
Air Force - 11, 17, 99
DLA - ES

User activities:
Army - ME
Navy - AS, MC
Air Force - 19

Preparing activity:
Army - ER

Agent:
DLA - ES

(Project 5950-0734-02)